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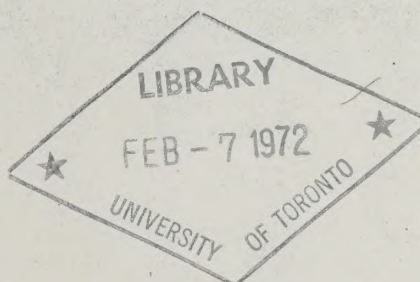
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EVALUATION OF DATA ON FARM OPERATORS  
BASED ON THE OCTOBER 1968 CENSUS TEST

by

David E. Gower  
Economic Characteristics Section  
Census Division, DBS

Working Paper (Demographic and Socio-Economic Series) No. 4



Ottawa, June 1969



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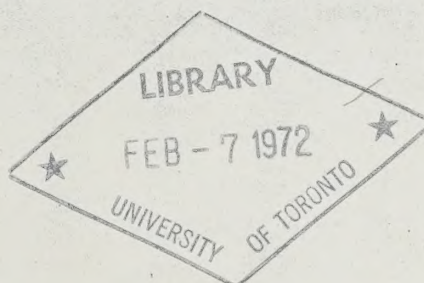
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## 1. Introduction

A Census Test was carried out in the October of 1968 in four areas of the country: Annapolis Valley in Nova Scotia, Napierville in Quebec, Durham County in Ontario and an area surrounding Lethbridge in Alberta. These areas included in total about 36,000 persons in about 10,500 dwellings, of which about 3,000 were farm dwellings. Of these farm dwellings, 720, or 24%, received a long population questionnaire (2B) which included questions on the economic characteristics of the persons in these dwellings.

In addition, each farm received a Form 6 agricultural questionnaire which asked questions about the farm, e.g., acreage, sales, etc. It was possible to hand match the agricultural questionnaires to the relevant population documents, and thus obtain a wealth of economic and demographic information on persons classified as farm operators by the definition of the Agricultural Census (operators of a holding of one acre or more with sales of \$50 or more). This information has never before been available on Canadian farmers. In the past it was only possible to identify farmers on the population census by reference to the occupation question, which does not provide a complete count of farm operators.

Of particular interest, this test provided the first opportunity to test a new question: net farm income, and allowed, through the match, an evaluation of this data.

The tabulation program of the 1971 Census of Canada includes data on these new characteristics, and thus the match from the test gave some indication of the expected quality and distribution of this data.

In general, the results were mixed, as will be seen: bad enough to confirm the fears of the pessimists, but not so bad as to squash the hopes of the optimists.

Data on off-farm work of farm operators looked very promising. Class of worker and activity data had problems but showed reasonable patterns. Income data turned out to be horribly erratic on an individual level but became more reasonable when taken over large areas.

In this paper, wherever possible an attempt has been made to quantify as well as identify problems. Many of these attempted quantifications are based on rough data and heroic assumptions, and in addition all such measurements suffer from an attempt to infer nationwide patterns from the results from four small areas. Where specific numbers are given, therefore, they must be taken as ball-park estimates or indicators of direction.

## 2. Farm Income

(P45)	During 1967 what was your net income from:
2.	Operating a farm on your own account or in partnership? <i>State total farm income less expenses of operation. If lost money write "loss" beside the amount.</i>
Amount .....	\$ _____ <input type="radio"/> None

- Question 45 (2) from the Fall Test long form population document.



## 2.1 Historical Background

The introduction of a farm income question on to the Canadian Census occurred after a long controversy, and is a quite recent development. The 1971 Census will be the first Canadian census to contain such a question.

In the 1951 Census, the only question asked on income concerned wages and salaries, as this was considered the only source of income for which reliable reporting could be expected. User demand for data on other sources of income, e.g. self-employment, government transfers and investment led to questions on such sources being included in surveys starting in the 1950's. On the 1961 Census, despite the reluctance of the Census Division to get involved in an area subject to such (it was thought) low quality of reporting, questions on other sources of income besides wages and salaries were included on a special 20% sample form. This form also contained questions on migration and fertility and allowing for sealing for extra confidentiality.

In the 1961 Census, however, as in the normal household surveys up to 1965, farm income was not included. It was felt that a global question on farm income would yield unreliable results (a fear that, as is shown in this paper, was not wholly unjustified). In 1958 a survey of farm incomes was undertaken jointly by the DBS and the Department of Agriculture, but in this survey net farm income was not asked directly but rather calculated from the various expenditure and receipt items reported.

It was with some trepidation, then, that a question on net farm income was included on the 1965 income survey. When it was observed that the results were not totally unacceptable, the question was included in the various census test documents of 1966, 1967, 1968\* and 1969, and is now firmly committed for the 1971 Census.

Several reasons prompted this change of heart besides the results of the 1965 survey. First, it was forcefully argued by experts both inside and outside DBS that even poor data is frequently better than no data at all. Second, it was recognized from the 1961 Census that the attempt to exclude farm income (which was not entirely successful) was causing many problems at the enumeration stage. Third, some persons had begun to wonder whether data on farm income from self-employment would be much worse than data on non-farm self-employment, the problems of calculation being similar. Non-farm self-employment income had been gathered in 1961 and, while not flawless, had proved to be of considerable value\*\*.

However, probably the most telling argument in favour of including farm income was that conceptually, its exclusion represented a barrier to getting a complete picture of income flows of Canadians. For many uses economic analysts need to regard income as a complete package, and the omission of one important source for methodological reasons was, it was argued, unjustified.

Doubts about the reliability of farm income data persist, however, even among many who have pushed for its inclusion. It is the intent of this section of the paper, therefore, to attempt to evaluate the quality of the reporting found in the October Tests.

\* Analysis of the question was not practical from the tests before October 1968, however, as the areas covered in these tests were almost entirely urban and no significant use of this question was encountered.

\*\* For an evaluation of this and other 1961 income data, see "Incomes of Individuals", bulletin SX-11, 1961 Census (98-525) pp. I-IV.



## 2.2 General Picture of Reporting Farm Income

Some readers may be interested in a preview of what 1971 farm income data may look like. These tables, of course, represent the reporting of those tagged "farm operators" under the definitions of the Census of Agriculture. It is possible that a few other persons may report farm income, but it was not possible to tell whether or not these were farm operators from the test, because surrounding areas were not covered.

It is necessary to examine the general patterns of reporting so that the evaluation of the reporting can proceed on an orderly basis.

TABLE 1. Distribution of Farm Operators by Size of Net Farm Income in 1967 Reported on the Population Questionnaire, All Areas, Fall Test.

Income reported	Number of	Percentage
	persons	total persons
	No.	%
Not stated .....	99	13.8
None .....	103	14.3
Loss .....	116	16.1
Gain:		
1- 999 .....	74	10.3
1,000- 1,999 .....	83	11.5
2,000- 4,999 .....	151	21.0
5,000- 9,999 .....	62	8.6
10,000-24,999 .....	22	3.1
25,000+ .....	9	1.3
Total .....	719	100.0

From Table 1 it can be seen that 55.8% of farm operators reported a net gain from farming. An additional 16.1% reported losses, and the remainder, 28.1%, is divided between those reporting "none" and those not answering the farm income question. The "not stated" will, in 1971, be changed to a definite amount by computer edit.

What then of the 40.7% of farm operators who reported that they earned less than \$1000 from operating a farm in 1967? How many of these persons are really "poverty" cases? To determine this it is necessary to examine the reporting of total income for these persons:



TABLE 2. Distribution of Farm Operators with less than \$1000 Farm Income by Size of Total Income in 1967, All Areas, Fall Test.

Income reported	Number of persons	Percentage of persons
	No.	%
Not stated .....	12	4.1
None .....	22	7.5
Loss .....	12	4.1
Gain:		
1- 999 .....	35	11.9
1,000- 1,999 .....	61	20.8
2,000- 4,999 .....	82	28.0
5,000- 9,999 .....	58	19.8
10,000-24,999 .....	9	3.1
25,000+ .....	2	0.7
Total .....	293	100.0

For background, this table can be supplemented with one on total income of all farm operators:

TABLE 2A. Distribution of Farm Operators by Size of Total Income in 1967, All Areas, Fall Test.

Income reported	Number of persons	Percentage of persons
	No.	%
Not stated .....	79	11.0
None .....	28	3.9
Loss .....	13	1.8
Gain:		
1- 999 .....	38	5.3
1,000- 1,999 .....	111	15.4
2,000- 4,999 .....	249	34.6
5,000- 9,999 .....	143	19.9
10,000-24,999 .....	48	6.7
25,000+ .....	10	1.4
Total .....	719	100.0



What is interesting, though, is that the coefficients, unlike the absolute discrepancies, are remarkably constant from area to area. Since the coefficient of correlation is the most widely used measure of the strength of linear relationship of two variables, it can be concluded that the strength of the relationship between the reporting on the Form 6 and the net income reported is fairly constant over areas.

Despite the high levels of individual discrepancy, and even fair discrepancies within the individual test areas, the data seem to suggest that the larger the area over which the data is aggregated the less the overall discrepancy becomes. For the four areas together there is little overall discrepancy: the differences appear to have a tendency to balance each other out when one puts enough people together. For all areas combined, the average reported lies between the two calculated incomes, but is closer to the complex calculated. As stated above, the complex calculated is conceptually the preferable of the two calculated incomes, so this result is encouraging.\*

Two qualifications should be made of the data in Table 3. First, the absolute discrepancies are distorted by a few very large discrepancies (up to tens of thousands of dollars), in the worst cases almost assuredly caused by partial refusal to the agriculture document. If, for instance, the farmer leaves the expenditures section blank, the calculated incomes can become ten times or more greater than what it would be if complete reporting had been obtained. For this reason the coefficient of correlation is more informative than average absolute deviation in Table 3. In addition, in later parts of this paper distribution of calculated income rather than averages will be emphasized, to avoid distortion from these huge amounts.

The second qualification is that the reader should be cautioned not to be too concerned by the odd-looking averages in Column 1 for farm income. The test areas were small and the farm incomes are by no means indicative of provincial averages. The Quebec area, for instance, is one of that province's richest farming areas, close to the Montreal market. The Durham County area in Ontario, on the other hand, is an area of dying farms, many being held, apparently, by land speculators and persons using farms as tax write-offs. (It will be seen immediately below that the cause of the low average of the Durham area is the very large number of losses reported).

2.3.2 Losses — As shown in Table 1, 16.1 % of farm operators reported a loss from farm income. This percentage is probably high and should not be taken as necessarily indicative of an expected national figure.

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\* The fact that the reported incomes is higher than the "complex calculated" leads one to suspect that some farmers may, in fact, be including changes in inventories in their calculations of reported incomes.



TABLE 4. Number of Farm Operators Reporting Losses by Area, October Test

Area	Number reporting losses No.	Percentage total farm op's. in area %
Nova Scotia .....	15	13.4
Quebec .....	19	9.2
Ontario .....	59	27.1
Alberta .....	23	12.6
Total .....	116	16.1

Over half of the losses reported came from the Ontario area, which contained less than 30% of the farms. If, as seems reasonable, the other areas are taken as more typical, the loss rate may be expected to be closer to 12% than 16% nationally, but with large regional variations.

To investigate the validity of this loss reporting, these figures will be compared with both the calculated income and the farm acreages. Two kinds of losses were encountered: those specified as to size (64 of 116) and those not specified (52), i.e., "loss" or "perte" written in. Unspecified loss amounts will need to be handled by computer edits, and perhaps minor changes in the question wording.

Of the 64 losses for which a specific amount was given, the average reported value was \$ - 2,643. The "complex calculated" incomes for these persons contained 15 results greater than zero, or 23% of the specified losses. The fact that 23% of farmers reporting losses had calculated incomes greater than zero seems reasonable in the light of the discrepancies between calculated and reported incomes revealed in Section 2.3.1 above, and may well be due to farmers deducting full value of additional capital from net farm income, instead of the 10% deducted from the calculated income.

Of 52 unspecified losses, 47 gave enough Form 6 information to enable their complex calculated income to be determined. Of these 47, 17 (36%) were positive which, although larger than the 23% above, is probably still not unreasonable, the above explanation about additional capital equipment applying here as well.

On the basis of comparison with Form 6 information, then, it seems reasonable to conclude that the bulk (two-thirds to three-quarters) of losses reported are backed up by information from the Agriculture Census document. The rest may be paper losses caused by faulty accounting procedures on the part of farm operators.



A further check against acreage of farm is possible. On the hypothesis that losses are more likely on small farms than large ones, the average cultivated acreage was calculated. The acreage for farms reporting losses was 91 acres, as against 135 acres for all farms and 169 acres for farms reporting gains. While this acreage difference is not too large, it is substantial and in the expected direction, and confirms that loss reporting is in general probably justified.

2.3.3 "None" — As stated earlier, 103 (14.3%) of farm operators reported "none" in farm income. Aside from the 10 who ran incorporated farms and reported their earnings as wages, the reporting of "none" would not seem conceptually justifiable (except in the unlikely case of a farmer's gross sales precisely equalling his costs).

There are three possible reasons for an unincorporated farm operator to report "none" to net farm income:

- (a) Farmers earn very little and round to 0 in the same manner as they would round to, say, \$5,000.
- (b) Farmers have earnings but do not wish to state it, and use "none" as a form of refusal.
- (c) Farmers have earnings but mistakenly use the wrong income answer to report — usually wages and salaries.

Some idea about the relative importance of these reasons can be gathered by examining the complex calculated incomes (including depreciation) of these farmers.

TABLE 5. Distribution of Farm Operators Reporting "None" in 45(2) by Size of Calculated Net Farm Income, All Areas, Fall Test

Amount reported	Number of persons	Percentage of persons
	No.	%
Losses, total .....	48	48.0
\$5,000+ .....	2	2.0
2,000-\$4,999 .....	5	5.0
— \$2,000 .....	41	41.0
Gains, total .....	52	52.0
— \$2,000 .....	25	25.0
\$ 2,000-\$ 4,999 .....	17	17.0
5,000- 9,999 .....	6	6.0
10,000- 24,999 .....	2	2.0
25,000+ .....	2	2.0
Total .....	100	100.0



First, the population question asked for income from the 1967 calendar year, whereas the Form 6 questions referred to the 12 months preceding the October census test, a lag of 9 months. This difference was probably mitigated, however, by the fact that the enumeration manual allowed farms to opt for reporting the calendar year, a course of action undoubtedly taken by many farmers with income tax records handy.

Second, these figures can only be compared for farmers not in partnerships, since if two persons split the farm income, part of it goes to a person who is not a farm operator by census definition (there can only be one operator per farm, even though all partners may report "farming" by occupation or income source) and is therefore lost in this match.

Third, incorporated farms are a problem in matching. In accounting theory (and in tax law) operators of incorporated farms should report net earnings from the farm under wages and salaries.\* Of 32 operators of incorporated farms in the match, only 10 did so, the rest using Question 45(2). For this reason incorporated farms are included in Table 3.

Table 3 excludes, as well as partnerships, farmers who failed to give sufficient information to allow a complete comparison. The result of these exclusions is that the total farmers in Table 3 is 219 less than the total in the match.

Table 3 gives sufficient evidence to confirm most of the strongest fears about the reliability of farm income. The average absolute discrepancies between the calculated and reported incomes (Columns 4 and 5) are seen to be substantially larger than the average reported income. Between the areas the ratios vary from about even for Quebec to four times greater for Ontario. These discrepancies are equally as bad for both types of calculated incomes.

The coefficients of correlation shown in columns 6 and 7 are distressingly low, at around .50. Despite this, they are significant for each area well beyond the 99% level of confidence, which is equivalent to saying that it is possible to state with 99% confidence that these correlations could not be the result of an accident, but reflect a real relationship. The meaning of these coefficients of correlation is that while calculated incomes can be used to predict reported incomes, the reliability of such use is questionable and must be regarded with suspicion.

The low correlation is not, under reflection, too surprising. Besides the above-mentioned problems of changes in inventories and differences in the time reference period, there are also computational problems of improper accounting procedures for acquisition of capital equipment. The farm operator may, for instance, deduct the value of a new tractor from his net income for the year in which he purchased the tractor, instead of depreciating it over a period of years.

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\* It is also possible to report these as dividends, but such practice was not observed among the farm operators in this match.



It can be seen from Table 2 that only 23.5% of those reporting less than \$1000 farm income had total income of less than \$1000, and from Table 2A it is evident that only 11% of all farm operators had total income of less than \$1000.

### 2.3 Evaluation of Farm Income Reporting

2.3.1 Comparison of Three Different Farm Incomes - It is always risky to try to evaluate an income figure by comparing it with another amount for the same population from a different statistical source. Definitional problems aside, what one obtains are different sets of figures, all of which may be incorrect. Nevertheless, the distribution of the figures can sometimes be illuminating, and if all else fails one can always make heroic assumptions about one of the figures being "correct".

The three different net farm income figures available for comparison are as follows:

- (a) Net farm income reported on the population document (Question 45(2) of Form 2B), as described in Section 2.2.
- (b) "Simple Calculated" income, taken from the Form 6 agricultural document, which consists of gross sales of agricultural products minus gross expenditures which include such items as wages paid to hired help, taxes, rent, feed, fuel, machinery rental, repairs, seed, interest, insurance livestock purchases, etc.
- (c) "Complex Calculated" income, also from Form 6, which is the "Simple Calculated" in (b) above minus an estimated depreciation, taken as 10% of the reported value of machinery and equipment. This figure of 10% was approved by Census of Agriculture personnel as a good approximation, and allows ease of computation. There was no way of estimating the value of depreciation on buildings, although this was not undoubtedly present also.

Under basic accounting principles, if all questions have been answered correctly, the "Complex Calculated" is preferable to the "Simple Calculated" which, since it ignores depreciation, should be too high. Both calculated incomes, however, omit changes in inventory from the calculation. While such changes are included under accepted accounting procedures, there is a very real question as to whether they would be used in calculating by farm operators.\*

In comparing the two calculated farm incomes with the reported net farm income from the population document, some basic differences must be borne in mind.

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\* Changes in Canadian farm inventories are - \$124m in 1967, and + \$196m in 1968. Over the 12-month period October 1967 - October 1968 (the 12 months preceding the Test Census, the period on which farm operators were asked question on the agriculture document), some small gain in net income probably occurred which is not included in the calculated income. This would lead us to expect the "true" (i.e. if proper accounting practice was followed) net farm income to be somewhat above the "complex calculated" figure.



TABLE 3. Relationship Between Calculated and Reported Net Farm Incomes, October Test

Area	Av. Net income reported on Form 2B (1)	Av. Net Calculated without Depreciation (2)	Av. Net Calculated with Depreciation (3)	Av. absolute discrepancy between 1 and 2* (4)	Av. absolute discrepancy between 1 and 3* (5)	Coefficient of correlation 1 to 2* (6)	Coefficient of correlation 1 to 3* (7)	Number of farmers (8)
Nova Scotia (Annapolis)	1,012	1,052	599	1,296	1,402	.47	.45	86
Quebec (Napierville) ...	3,810	3,610	2,815	3,450	3,536	.53	.50	171
Ontario (Durham) .....	843	2,060	1,304	3,308	3,192	.49	.52	128
Alberta (Lethbridge) ...	3,420	4,710	3,585	5,490	5,660	.50	.52	116
Total .....	2,484	3,015	2,326	3,509	3,572	.50	.50	501

\* Columns 4 and 5 are the averages of the individual discrepancies between the net reported and net calculated for each farmer. Similarly columns 6 and 7 are taken by correlating the two figures for each of the 501 farmers.



Table 5 shows that about 1/2 of all person with "none" in farm income have calculated incomes below zero, and 1/2 above. This initial observation means that the median calculated income of this group is close to zero, which leads credence to the acceptance of the reporting of "none" as a realistic representative figure for the income of this group.

If an amount of either loss or gain of less than \$2,000 can be accepted as close enough to zero to allow rounding to zero (reason "A" for giving 0), then 66% of the farm operators fall within this group. Of the one third who have calculated incomes too large in absolute amount to justify rounding to zero, these can be broken down by reason B (refusal) and (C) (misreporting by source). As is found in Section 3.3 below, 17 of the farm operators have been estimated to have misreported their source of income. All of these 17 have net farm incomes of "none", as seen in Section 3.3. If only the three reasons given above are important, the residual, 17%, must be assigned to reason B.

The estimates made of the importance of the three reasons for unincorporated farmers to report "none" in net farm income are:

- Reason A: 66% of farm operators
- B: 17% of farm operators
- C: 17% of farm operators

Reason A is a "valid" reason, e.g., "none" is not a misleading answer, albiet slightly inaccurate. Reasons B and C are "invalid" reasons, that is, the answers are misleading. This allows the conclusion that about two-thirds of "none" answers were "valid", one-third "invalid", provided that one accepts rounding from as much as \$2000 as "valid".

A final brief check can be made against acreage, as before. Farms of farm operators reporting "none" had an average 88 cultivated acres, compared with 135 for all farms and 169 for farms reporting gain. This lends further weight to the belief that small real amounts (resulting from small farms) are important in causing the reporting of "none".

2.3.4 "Not Stated" - Another large category was "not stated" - 13.8% of all farm operators failed to give an answer to the net farm income question.

The term "refusal" is possibly a little harsh in describing these persons. If a person intends to put "none", a blank is frequently used to signify such a response. This is especially true if other parts of the income question are answered.

The first step in analysing the "not stated" group, therefore, is to examine their total income reported.



TABLE 6. Distribution of Farm Operators Not Responding to Net Farm Income, by Size of Total Income in 1967, All Areas, Fall Test.

Income reported	Number of persons	Percentage of persons
	No.	%
Not stated .....	55	55.6
None .....	5	5.1
1- 999 .....	2	2.0
1,000- 1,999 .....	4	4.0
2,000- 4,999 .....	16	16.2
5,000- 9,999 .....	15	15.2
10,000-24,999 .....	2	2.0
25,000+ .....	0	0.0
Total .....	99	100.0

44% of these persons gave a total income figure. Some of the remaining 56% undoubtedly gave other sources of income, but a large proportion of these are complete refusals to the income question.

Comparing the distribution of incomes for the 44% who reported in total income with the figures on Table 2A, it is interesting to see that in general the 44% who reported total incomes are not too dissimilar in income distribution from the overall population of farm operators in the match. This indicates that the income characteristics of non-respondents are not too dissimilar from the overall population of farm operators. Such a conclusion must be qualified, however, by the statement that the composition of the incomes may not be similar, since the above persons are those with no farm income reported, while the bulk of persons in table 2 have farm income. The suspicion thus arises that "not stated" is caused by a misreporting of farm income to some other source, and is not intended to signify "none".

The average cultivated acres of farms of farm operators not responding to the farm income question is 126 acres, as against 137 for all farms. This figure is not too much lower than the overall, and is a further indication that non-respondents have quite similar characteristics to respondents. In Section 2.3.3 it was noted that average acreage of farms whose operators gave "none" was only 88 acres, so the thesis that non-responses are intended to be "none" is further weakened.

A final check can be made by examining the calculated income of those total non-responders, that is for the 55 who gave neither farm income nor total income. Of the 55, 41 gave enough Form 6 information to enable calculated incomes to be determined. The distribution of the results are as follows:



## 2.4 Other Sources of Income Reported by Farm Operators

2.4.1 Wages and Salaries — After net farm income, by far the most important source of income of the farm operators observed in the match was wages and salaries. As will be shown in Section 3.3 below, a small percentage of these amounts appeared to be misplaced farm income, but the vast bulk was legitimate second sources. In some cases wages were a primary income source, as is shown in Table 8:

TABLE 8. Number of Farm Operators by Type of Income Reported, All Areas, Fall Test

Type of Income	Number of Persons	Percentage of Persons
	No.	%
Wages greater than farm .....	153	21.9
Farm greater than wages .....	57	8.2
Wages only .....	82	11.7
Farm only .....	311	44.4
Neither source reported .....	97	13.8
Total .....	700	100.0

Almost half of the farm operators in the match reported they only received farm income. However, it is interesting to note that of the 31.1% who reported both sources, the vast bulk reported wages as greater than farm income, which suggests that if farmers have an off-farm income source, they are likely to rely primarily on that source.

Some readers familiar with problems of gathering income data may suspect net-and-gross double-reporting to be responsible for this pattern. As shown in section 3.3 below, very little double-reporting is indicated.

To complete the picture, the distribution of wages reported is given in Table 9.

TABLE 9. Distribution of Farm Operator's by Size of Wages Reported, All Areas, Fall Test

Income reported	Number of Persons	Percentage of Persons
	No.	%
Not stated .....	118	16.4
None .....	322	44.8
1- 999 .....	35	4.9
1,000-1,999 .....	50	7.0
2,000-4,999 .....	98	13.6
5,000-9,999 .....	77	10.7
10,000-24,999 .....	16	2.2
25,000+ .....	3	0.4
Total .....	719(1)	100.0

(1) Small variations in the total number of farm operators between tables are caused by minor omissions from some tables because of computational problems.



TABLE 7. Distribution of Farm Operators with "Not Stated" in Both Net Farm Income and Total Income, by Size of Calculated Net Farm Income, All Areas, Fall Test.

Amount	Number of persons	Percentage of persons
	No.	%
Loss:		
\$5,000+ .....	2	4.9
2,000-\$4,999 .....	4	9.8
- \$2,000 .....	9	22.0
Gain:		
- \$2,000 .....	11	26.8
\$ 2,000-\$ 4,999 .....	11	26.8
5,000- 9,999 .....	3	7.3
10,000- 24,999 .....	1	2.4
25,000+ .....	0	0.0
Total .....	41	100.0

Table 7 shows that 36.7% of "not stated" persons showed calculated losses, a figure substantially above the 16.1% reported in Table 1. Conversely, only 9.7% had calculated gains of more than \$5,000, compared to 13.5% of all farm operators in Table 1. These figures would tend to indicate that non-respondents may be slightly lower-income persons than farm operators who respond, although the difference is not likely to be too great. There is little indication that "not stated" is an intended statement of the non-respondents.

The overall conclusions of this section are therefore that the thesis that non-response is an intended "none" response is not valid. Instead, the evidence indicates that farm operators who fail to respond are a fairly representative cross-section of all farm operators, with perhaps a slight tendency to be on the lower end of the income scale. Part of the reason why some fail to give a farm income is refusal, while other non-responses appear to be caused by reporting farm income on the wrong line of the income question. From Table 6, it is possible to estimate that the first reason applies perhaps a half of the time, while the second is probably slightly less important.

Computer assignment procedures as currently planned may therefore produce a slight upward bias in farm incomes in 1971 for the 7% who may need such an assignment (total blanks to the income question). The distortion should not be very great, however.



The percentage of farm operators reporting wages (38.8%) is far smaller than those reporting net farm income, which is to be expected.

The picture of wage-reporting is not complete with respect to this paper until the reader has looked at Section 3.3.

2.4.2 - Other Sources - Other income sources (non-farm self-employment and non-employment sources) were not frequently reported, except those (e.g. family allowances) common to families across the country. A very few cases of non-farm self-employment were observed that looked suspiciously like misplaced farm income, but confirmation of that suspicion was not possible.

### 3. Off-Farm Work

#### 3.1 New Data Available

In 1971 it is proposed to perform a computer match of the Agriculture and Population Censuses, matching each agriculture document with the population record of its farm operator. This will accomplish on tape what was done by hand for the Fall Test for this study.

Many new types of data on farms and farm population will be available from this match, of which one of the most interesting will be a more complete picture of the off-farm work of farm operators.

Before the proposed 1971 match, the only Census data available on work input of farm operators was the number of weeks worked in the past year by those reporting farming as their occupation. There were two major limitations to this data; first, occupational reporting did not pick up all farm operators, as will be seen in Section 3.2 below. Second, there was no way of knowing how many of the weeks worked in the previous year were at regular farming duties, and how many were off-farm work.

In 1971 the form 6 is intended to contain a question asking the farm operator how many days of off-farm work he performed, and the type of off-farm work.

It is not intended here to evaluate the reporting on type of off-farm work, since the characteristics of such reporting are very sensitive as to area, and the four areas are not likely to be representative of Canada in this regard. In addition, the persons of most interest for this statistic, e.g., the logger-fishermen-farmers of the Maritimes, were not included in the test.



Of more value from this test, however, are data on days worked off-farm. It will be seen that this data appears to be very good as Census statistics go, showing only a low rate of inconsistency.

Two methods of evaluation of this data are possible: comparison with occupational reporting and comparison with income sources reported. In both cases this comparison also allows for an evaluation of the other statistics as well.

### 3.2 Off-Farm Work Evaluated by Occupational Reporting

Of the 700 odd farmers in the match, 300 reported on the Form 6 that they did some off-farm work during the previous 12 months to the Census. This reporting can be compared with the reporting of occupation on the population document, which asked for main occupation last week, or most recent occupation since January 1, 1967.

One would expect that the incidence of reporting a non-agricultural occupation would increase as the number of days of off-farm work increased. As Table 10 shows, such was the case:

TABLE 10. Type of Occupation(1) Reported by Farm Operators by Number of Days of Off-Farm Work, All Areas, Fall Test

No. of days of off-farm work	Agricultural occupation	Non-agricultural occupation
None .....	391	35
1- 49 .....	53	13
50- 99 .....	26	11
100-149 .....	13	14
150-199 .....	10	26
200-249 .....	7	25
250+ .....	10	66
Total .....	510	190

(1) "Occupation not stated" was assigned within each class of days of off-farm work between agric. and non agric. on the basis of the ratio of those stating occupation.



These can be changed to horizontal percentages thus:

TABLE 10A. Type of Occupation Reported by Farm Operators by Number of Days of Off-Farm Work, All Areas, Fall Test

No. of Days of Off-Farm Work	Occupation Reported on Pop. Doc.		
	Agric.	Non-Ag. %	Total
None .....	92	8	100
1- 49 .....	80	20	100
50- 99 .....	70	30	100
100-149 .....	48	52	100
150-199 .....	28	72	100
200-249 .....	21	79	100
250+ .....	13	87	100
Total .....	73	27	100

It must be remembered in evaluating Tables 10 and 10A that it is possible to be involved in agricultural off-farm work, although the frequency of so reporting was low for those who reported a non-agricultural occupation on the population document — of 74 persons reporting agricultural off-farm work on the agriculture form, only 7 reported a non-agricultural occupation on Form 2B.

Tables 10 and 10A show the expected result, supporting the quality of both the data on off-farm work from the Form 6 and the occupational data on population document 2B. For those reporting no off-farm work, 85% reported a non-agricultural occupation. This percentage grows dramatically as the number of days of off-farm work increase, until for persons working off-farms for 250 days or more 5 out of 6 reported a non-agricultural occupation.

The only discouraging part of this table is the 8% of farm operators who reported a non-agricultural occupation but no off-farm work\*. For those persons there is obviously something wrong, and the suspicion is that the off-farm work is not reported, since an omission of data is more usual than the giving of wrong data.

Looked at another way, at least 35 of the 700 farm operators have been caught failing to report off-farm work. Since 300 persons did report such work, this figure should have been at least 335. In other words, the percentage reporting off-farm work appears to be at least 11% low.

\* As stated previously, there is a difference in time periods involved: the agriculture document referred to the past 12 months, while the population document asked for either work done last week or most recent job since Jan. 1, 1967. The only case where this time difference could explain a discrepancy, however, would be the unlikely situation of working off-farm since Jan. 1, 1967 but doing no off-farm work since Oct, 1967. This situation was not observed on any document.



Aside from this qualification, the comparison with occupational reporting seems to indicate that data on off-farm work is of quite good quality.

### 3.3 Off-Farm Work Evaluated by Type of Income Reported

As a check on the results of 3.2, the number of days of off-farm work can be compared with the frequency of reporting wages as against farm income. One would expect that the larger the amount of off-farm work, the more likely the person would be to have wages and, indeed to rely on this source for the major part of his income.

Table 11 duplicates Table 8 above, but includes a breakdown of work off-farm.

TABLE 11. Type of Income Reported (Wages or Farm Self-Employment) by Number of Days Worked Off-Farm, Farm Operators, All Areas, Fall Test

Number days off-farm work	Wages greater than farm	Farm greater than wages	Wages only	Farm only	Neither	Total
	(1)	(2)	(3)	(4)	(5)	(6)
None .....	31	5	34	262	68	400
1- 49 .....	15	16	9	26	10	76
50- 99 .....	6	12	10	7	2	37
100-149 .....	11	13	3	4	3	34
150-199 .....	22	3	3	6	5	39
200-249 .....	17	3	5	3	2	30
250+ .....	51	5	18	3	7	84
Total .....	153	57	82	311	97	700

Table 11 is somewhat complex to analyse, so it will be boiled down in the following manner.

First, the "neither" column can be eliminated, leaving 603 persons who gave an amount in one of the income categories. The "neither" category can be considered as "non-response" (the non-farm self-employment income category being very little used).

Columns 1 and 3 can be combined into a "wage dominance" column, and 2 and 4 into a "farm dominance" category. The table now looks as follows:



TABLE 12. Type of Income Reported by Days of Off-Farm Work

Days off-farm work	Wage dominance	Farm dominance	Total
None .....	65	267	332
1- 49 .....	24	42	66
50- 99 .....	16	19	35
100-149 .....	14	17	31
150-199 .....	25	9	34
200-249 .....	22	6	28
250+ .....	69	8	77
Total .....	235	368	603

This can be put into percentage terms, adding horizontally.

TABLE 12A. Type of Income Reported by Days of Off-Farm Work,  
All Areas, Fall Test

Days	Wages Dominance	Farm Dominance	Total
	%		
None .....	19.6	80.4	100
1- 49 .....	36.4	65.6	100
50- 99 .....	45.7	54.3	100
100-149 ..	45.1	54.9	100
150-199 .....	73.6	26.4	100
200-249 .....	78.7	21.3	100
250+ .....	89.6	10.4	100
Total .....	38.9	61.1	100

Table 12A shows that as the number of days of off-farm work increases, so does the frequency of wage-dominance over farm-dominance. This change in frequency (from 20% wage-dominance for no off-farm work persons to 90% for those with over 250 days) is in accord with expectations and attests to the quality of both the off-farm data and source of income data.

Particularly encouraging is the fact that very few persons who reported off-farm work failed to report wages (columns 4 and 5 of Table 11) and of those who did fail, most are in the 1-49 day brackets, and therefore any wages they may have reported are likely to be small.



The only fly in the ointment is the 70 (10%) persons who report wages but no off-farm work, (found by adding the "none" row, col's (1) (2) and (3) in Table 11). Of these about one-half report only wages. For these persons reporting only wages some are cases of failure to report off-farm work, and some may be misreporting farm income into the wages category.\* Of the others who report both sources but no off-farm work, some may be double-reporting (net and gross) but also likely is the omission of off-farm work. Since in Section 3.2 it was estimated that at least 35 farm operators failed to report off-farm work, this failure may be responsible for at least half of the 70 problem cases. When one adds in a few (number unknown) possible farm managers who worked for an owner for a wage but made the day-to-day decisions, thus qualifying as a farm operator in the Census, most of the remaining cases seem to be accounted for. It seems, therefore, safe to say that the number of double-entry cases (gross earnings in wages, net earnings in farm self-employment) and those who misreported farm income into wages, is low, a few percent at the most.

Therefore, it seems fair to say, with the earlier proviso from the comparison of occupation and off-farm work that the number of persons reporting off-farm work is about 10% low, that the statistics on off-farm work and those on income source agree very well, and lend support to the accuracy of both types of data.

#### 4. Other Characteristics

Farmers have shown some confusion with class of worker (wage-earner, unpaid family worker, self-employed) but their reporting on work activity seemed to be relatively straightforward.

##### 4.1 Class of Worker

It is not intended here to review in detail the answers to this question, since this data will be extensively modified in 1971 by computer edit. Of particular interest, however, was that 8% of farm operators answered "unpaid family worker" (an incorrect response by Census definitions) while another 7% reported both "unpaid family worker" and "self employed". The rest reported "wage-earner" (correct for those reporting a non-farm occupation) and "self-employed" (appropriate for those reporting farm operator as occupation).

Not surprisingly, the bulk of the farmers reporting "unpaid family worker" had small farms with low incomes, although some quite prosperous farmers also reported this way.

Machine edits will change all "unpaid family worker" reporting in 1971 for farm operators to "self-employed" so distortion of the data will not be expected to occur from such reporting.

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\* To provide an estimate needed in Section 2.3.3, one-half of the 34 "wages only" persons who reported no off-farm work will be assumed to have misreported by source. Thus, 17 of 700, or 2.4% of farm operators are estimated to have made such a mistake. This figure must be low since it is possible that some persons reporting off-farm work may also have misreported farm income. Lacking a basis for such an estimate however, the figure of 2.4% will be allowed to stand.



#### 4.2 Activity

A few farm operators (9%) failed to report any work activity in the week prior to the test. Presumably, operating a farm is usually a continuous job, although one can conceive of situations when, in October (the time of the test), a farm operator had so little to do in the previous week that a negative answer is appropriate when asked if he worked last week. Non-response may also account for some of this reporting.

The figure can be expected to be lower than the 9% test result when the 1971 Census is conducted in June. Agriculture Census officials expect it to be virtually nil.

#### 5. Summary of Findings

1. The response rate of the population question on net farm income for the farm operators in the match was 86.2%. 16.1% of farmers reported losses, 14.3% nones, and 10.3% between \$1 and \$999 gain.
2. Discrepancies between the net farm income reported on the population document and the information on the agriculture document were very large on an individual basis, but declined markedly with aggregation of figures. This suggests that reporting inaccuracies tend to be random and may be based on improper bookkeeping and calculating procedures by farm operators. In particular, depreciation practises for farm capital is suspect.
3. Upon investigation, loss reporting appears to be largely supported by other information available on the match.
4. Reporting of "Nones" appears to be largely a matter of rounding to zero, although refusal and a misreporting of income to source were also found.
5. Persons not responding to the net farm population document appeared to have similar characteristics to those who responded, although they may be slightly less well off.
6. Wages and salaries were reported by 41.8% of farm operators, and farm income by 74.5%. 31.1% reported both, and the bulk of this latter group reported wages as larger than net farm income.
7. Three out of 7 farmers reported off-farm work, and a check against reporting of primary occupation confirms the validity of this reporting. There is evidence, however, that the figure of farmers doing off-farm work is about 10% low.
8. The reporting of off-farm work by farm operators also nicely corresponds with the reporting of sources of income.
9. A definite tendency was noticed for farm operators to report themselves as unpaid family workers instead of self-employed.





